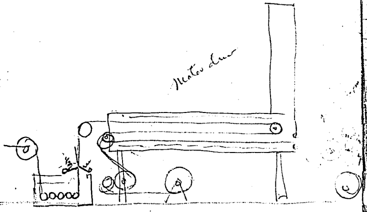
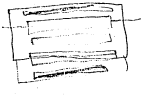
Notebook, N-02-05-04

This notebook contains dated entries from May, October, and December 1902, and November 1903. All entries are by Edison. The book contains notes and drawings regarding chemicals that produce "electric[ity] by friction"; these notes may be related to motograph experiments. Also included are entries pertaining to storage batteries and phonograph recording apparatus, along with several rough phonograph drawings. A marginal notation indicates that some of this material was recopied into an unidentified "big book." The pages are unnumbered. Approximately 70 pages have been used.

Vol I — Read
Vol II " for Elec by friction
Vol II "


Motor drive



TAE
May 4
1902

Chemicals Electric by friction

Entd by book

Oxalate of Calcium Elec by friction

Bebirine white, amorph. powder, Elec by friction

Bucurumanga Resin "

Cinchonidine, pure white powder "

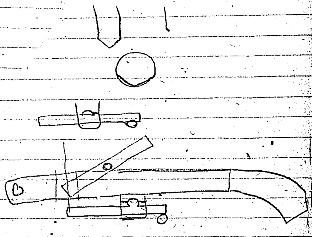
Disacryl white amorp pwdr strongly "

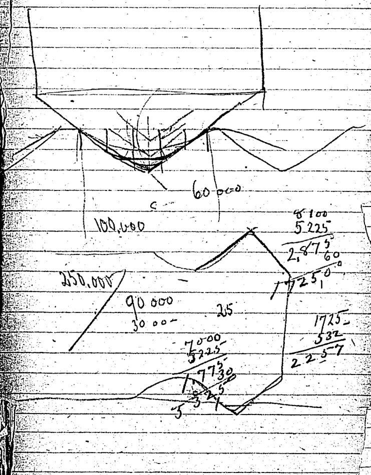
Elemi resin shines in dark when rubbed

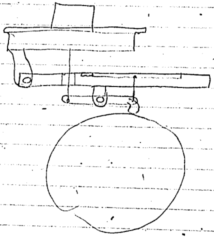
Glycosine. strongly Electric by Trituration

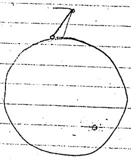
Hydrosalicylamide Lead salt highly Electric by friction —

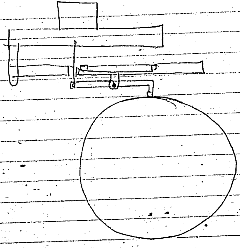
Myristone Elect by friction

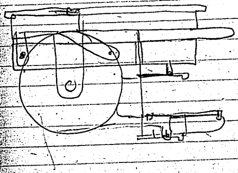


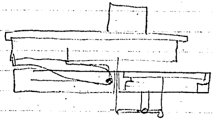

60 000
100,000
250,000
90 000
30 000
25
8100
5225
2,875
60
1725
1725
532
2257
7000
5225
1775
30
525
5











DEc 27 1902

TAE

Have Hetherington, make a phono master cylinder following— fused Chloride Silver, Sulphide Silver, Bromide Silver also Sulfide Hg— These can be cut with knife & will pbly make good blanks to record on for master records The surface of the Ag ones could be reduced to metal by reducing agents & plated on direct without the Vac process—

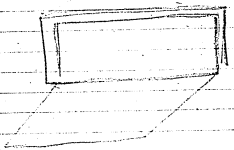
Also give him book of Amorp— Gelatinous Etc subs & have him make record cylinders by fusion & also by dipping in solvents & drying a blank or by Varnishing good Pears soap as a standard of quality to wk fm—

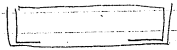
for storage as depolarizer instead Ni— use organic subs capable of oxdtn & reduction in alkali— Aniline blk does pretty good

Oxidyz by Chlorate K + HCl also Hypo, The Nitrogenous Hydrocarbon Especially those having [illegible] Nm the Benzol neuclus +

Try Syrian & other high Carbon residium Oxdz by Hypo etc, & rolling with graf in fine powde

Try the molybdates insol in Alkali, especially the black compounds

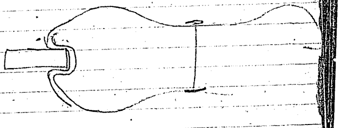


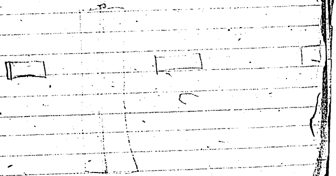


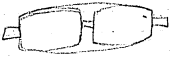
Compounds which conduct Electricity

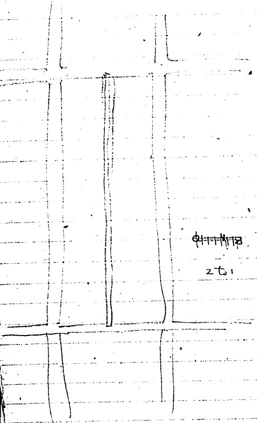
Stg Bat, pkts.

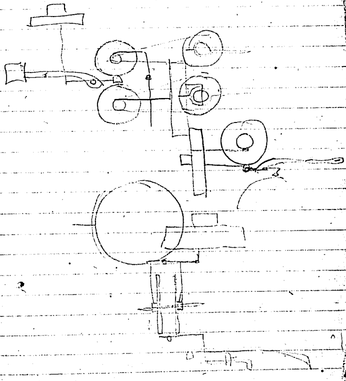
Oct 7 1902








2t.



Di-strontium ortho phosphate
by precip. Sr Salt by Di Sodium Phos
heating precip to fusing point
is Phosphorescent —

Try sublimation of sublimeing Chemicals
in Magnetic field, also dielectric
field — wall glass bulbs etc, notice phenomena
also in partial Vac,
Sublimers, Bichl Hg — Arsenic + Arsenious
Oxide — Carbon Hexachloride
Camphor Iodine AlCl — there is lot
Organic Chem NH_4Cl Anthracene,
etc

Gallotannic acid — yellow on expos to light
" Amorphous

Tartaric acid Crystals become
Luminous when rubbed in dark
room

Aluminum Potassium Tartrate, gummy
amorphous, due considerable excess
AlO_3

Hydraulic pressed powders such as Carbon alone or with binding agent,
Acid Soaps, Sulphur,

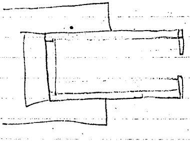
Hydrated Silica precip. from Silica by HCl dried in Vacuo dries to transpt glass with 23% H_2O —

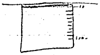
Materials that can be Turned bored etc, for experimenting

Slate, Steatite, Meerschaum, Cryolite, Marble, Gypsum, Mica, Hard Rubber, Celluloid, Vulcanized fibre, Mixture of Shellac & clay - Button stock, Horn, glue with powders, Bone, Ivory, Woods, Lava, Gutta Percha, plaster paris, Coral, Oxychloride Magnesia ditto Zinc, Phosphate Zinc - fused Chloride [illegible] Oxychloride Lead, aq sulfide - [illegible] fused [illegible]

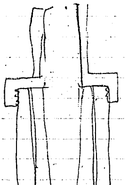
flexible sheets, Mica, Gutta Percha, Balata, Rubber (hard) — Celluloid, glue Gelatin, Gelatine & Sugar or syrup, Collodion, Vulcanized fibre, paper, Veneer of Wood, Tragacanth films, Oiled silk, Linseed attacked by S Chloride, Silicate Soda films, Carbonized paper. Reduced Collodion Carbonized — Leather, animal parchment, Fish glue films, Oleate lead, Sulphurized asphalt.

As a new material Carb Strontia pressed in Hydraulic press, with or without binders Could be moulded in shapes or turned and bored,



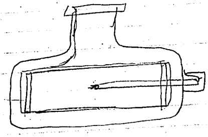


2



Nov 16 1903 TAE—

Phono Recorders —



Dia glass 1/2" wide 1½ long close fit on sides + on Knife edge at Ends oiled Knife edge rounded + perfect fit — possibly oil on side or a thin dope to close — get no buckles this way

possibly 1/4 long will answer

If the dia has an objectionable note, Can make it of 2 Mica .003 each + doped together —

115 -
190
703 5
115
200 218 5

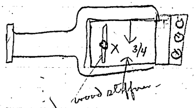
3000 -

5500 2

55
55
275
275
3025
218
27
6
152
436
588 6

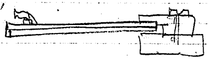
5886 -

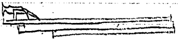
Nov 16 1903 Reeds

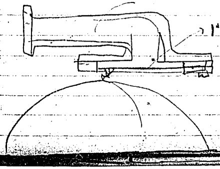

X
3/4
wood stiffner -

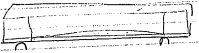
glass reed with knife on at X
used as dia - close fit 0005

possibly if objectionable noise to
Reed use 2 mica of 003 each & doped
between,

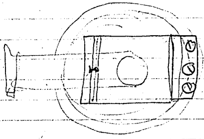




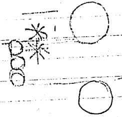

1" X 1" Reed -
.0005 fit
possible clean
Edges -



Nov 16 1903 Reeds



with .0005 fit around Edges total leak only Equal to hole area of .023 but on account friction its effect is very much less —
Dishing a disk is bound to make creases whereas with a reed this is not the Case —



Nov 16 1903 — S Bat,

Evidently some Bismuth hydroxide mixed with Ni hydroxide improves output of latter, Gwa has some tests running on dif percentages both precip'td | together —

6 Cents
5
4
5
3 ~~4~~ 20
20 +

4

.63
2
1.26

4 / 7 to ~~8~~ 6 / 1.75 / 1000 (6 c

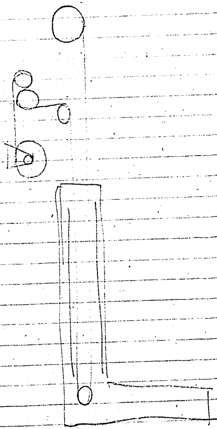
Fragile

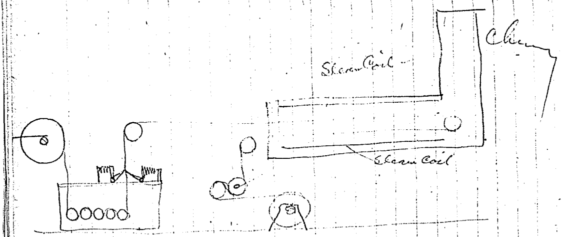
35
3
10.5
6
63.0

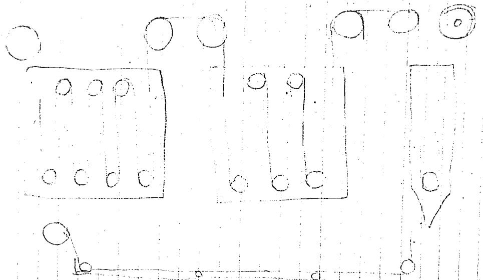
Fragile

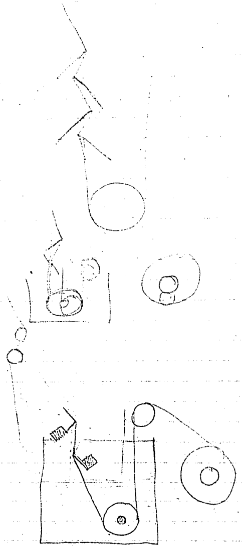
2225
3
6675
45
33375
26700
30,03

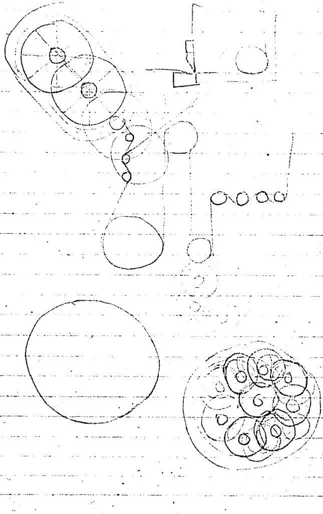
20c

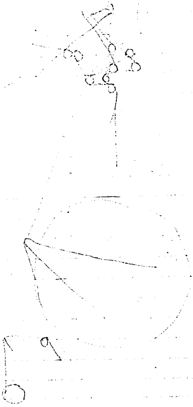


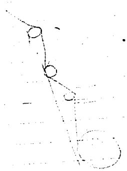

Steam Coil
Steam Coil
Chim











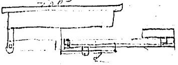
400, to Cb—

1c

10c

2 725
3
6,675
45
3337 5
27700
2003

4c



30'-2—

10'

40.

1" 1/16— 100— 50—

16 to inch

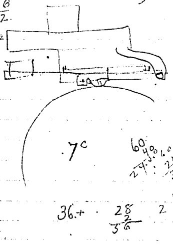
50c

20c

27
16
162
27
432

8- 18

2½ times Cost 200th



600
324
27.6

27.6 Cents—

60
4%
2.4 : 2.4
3.60
3.36
3.74

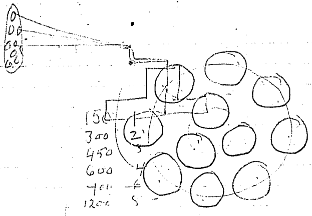
50
28
22

36.+ 28
2
56

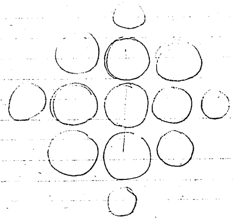
2

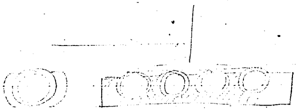
36 — 44 C 36

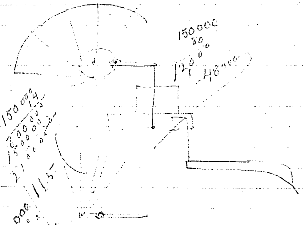
36c to Job— 56 to Retail 44 profit
14—


150
300
450
600
900
1200
2
3
4
6
5

3 | 1200—



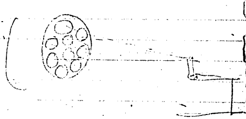




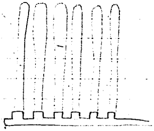
150000
30
120000
48000

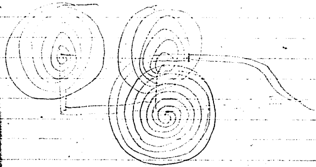
150000
15
150000
37
11.5

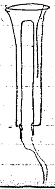
150000
130000
130



1060	1
530	2
265	4
132	8
66	16
33	32
16.5	64
8.2	120



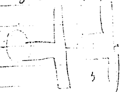




4790
17

335 3
4774 3 0
810

190
400



5250
5400
6900

5000–

10

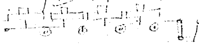
23653
81543
105193

(5009

55000

11 21

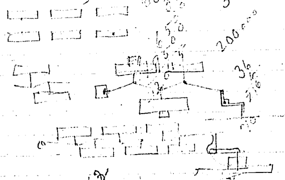
105193
55000
160193

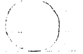


6500

5

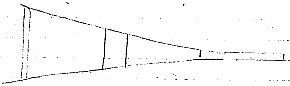
200





9/2 14 162
17
134
162
2754

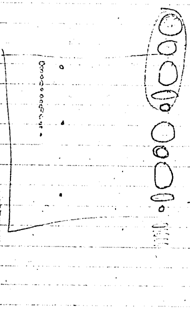
V



200

100–

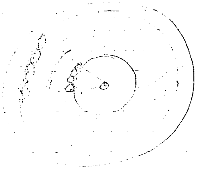
80 – 20



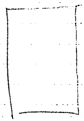
35
25
60
4 60
24
3.6

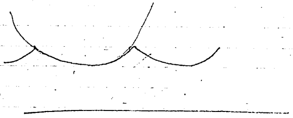
250
4
1000

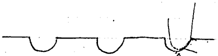
.35



11.5
50
3/ 6,5

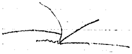


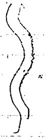




9.1/0 –

40000/





18000
52
360
900
936000

735

6

5.00

600 | 13100 (2.18

12000

1100

1600

500

135

6000

510

400 tons

6

2400

/ 400

40 tons

135 | 240 (1.77

135

1050

945

105

- 240

400 —

1.75 a lb

75

875

122.5

13.

735

660

75

20 | 500 (25

40

100

4 346

40 min [illegible]

131

34

22

25

110

44

550

50

80 ft min

6

480

75

6000

22 tons

6

132

225

60

1350

13

34

6000

48000

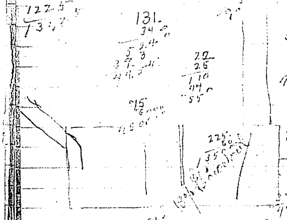
735

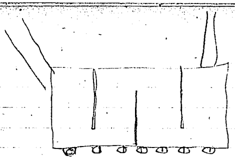
8

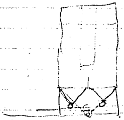
5880

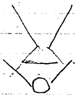
735

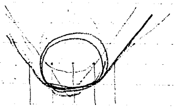
8.0

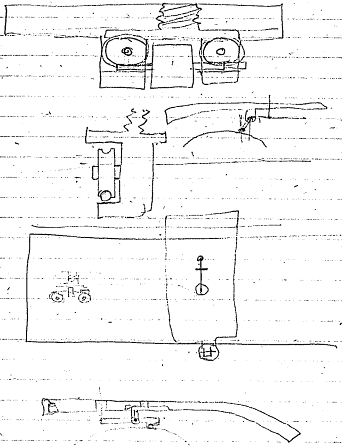


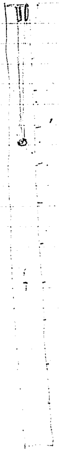




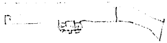


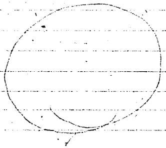




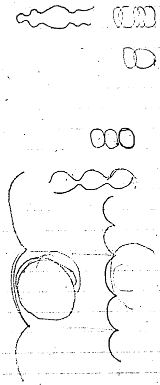


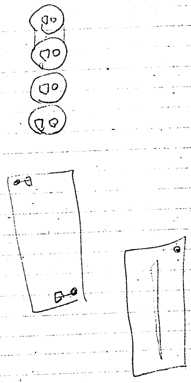
12to1-

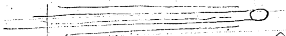


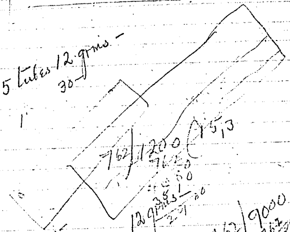


Compounds which blacken, change Color, decompose in the air









15 tubes 12 grms -

30 -

762 | 1200 (1.5,3

762

12 grms 38 1

762 | 9000 (11.8

762

1380

762

618

36

1900

650

212

750 ml

2000

240

175 | 1335 (7.62

1225

1100

1050

125 -

Ni_2O_3

Ni(OH)

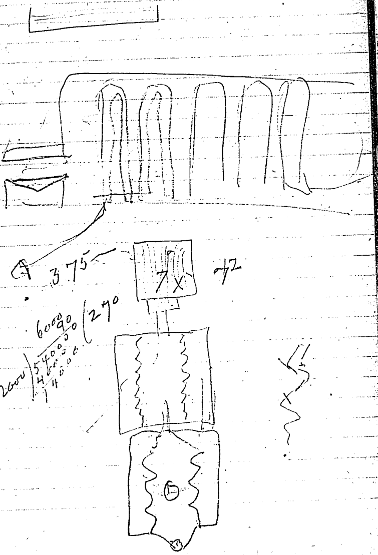
- 15

NiO_2

Ni(OH).

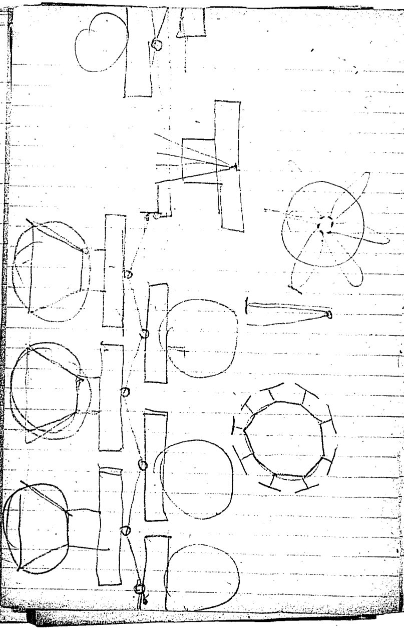
750

8095 -

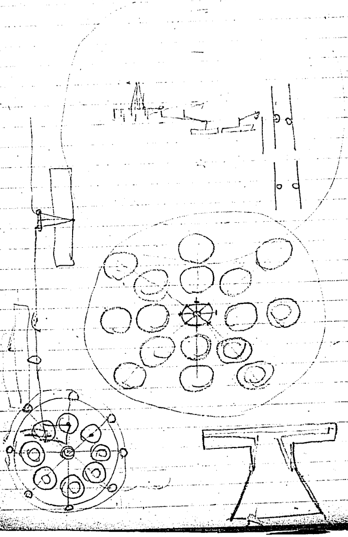


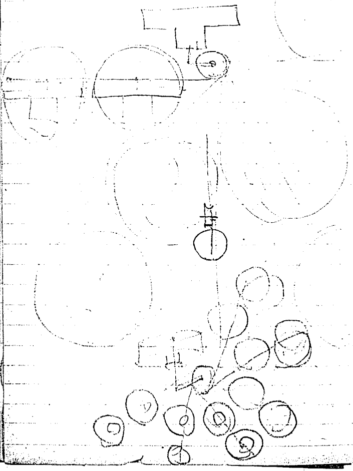
6000 (240

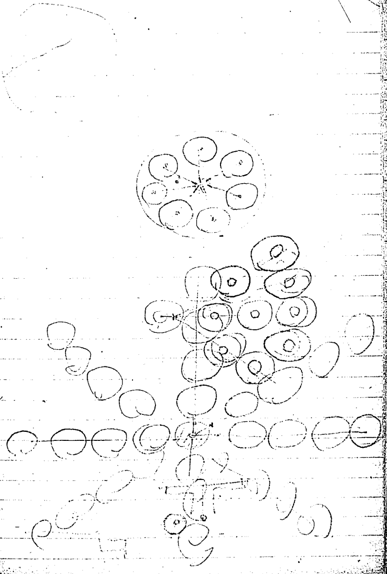
2600 | 5400



Solutions for chemical Recording by Elec







75)3330(44.4
300
330
300
30

175
21
175
350
3675

1335
21
1335
2670
280

44.400

200

15 grms will dissolve ~~12~~ mil grms HgO
90 " "

175 cc + 2 grms dis 5 [illegible] HgO
1335 7.5 more grs = 37 mlg
6 times than LiOH. 120)222(1.8
120
1020

75

175 cc
dis 10 mlg HgO — enough for 1 tube
5 mlg so
say
120 tubes
1.8)37(20
36
10

7.5 — 5)75(15 tubes —
44 4. grms

---

175 cc 2 LiOH dis ~~5~~ mlg HgO 1.8 Enough for 1 tube
1335 or 7½ times liquid dis — at 37 milgms —
only enough for 20 tubes —
but if you put 6 times more LiOH
dis 222 mlg which gives 1.8 mlg Each tube

2 120)154—(1280—
120
340
240
1000

If there is no material change in Conc there
its not circulation that is the trouble —

If HgO dissolves in proportion to LiOH in liquid
This might account for it —
[illegible] Each tube to get enough Hg

The other thing is that LiOH Combines
with the LiOH & then holds it

The trouble is in clog if it was the clog that
[illegible] it would [illegible] [illegible] HgO in
[illegible] amalgam so it is what probably
[illegible] its HgO —
The LiOH Must Combine with the Ni
in clog or dis — if on charge.

111

283 grms KOH A 4
15 " LiOH – " –

1000 grms outside liquid between plates 210 grms KOH.
11.1 " LiOH –

825 grms Metallic Iron –

Required in Fe to reduce 1 grm KOH per gram iron – 215 grms iron reduced. 215 grms KOH – wanted, 73 already in – 142 must come out solution (10) Say. 1000 grms 210 bring in it 142 out, leaves of 110 Circulation 66 grms in Sol –, or 6% Solution of LiOH, if this takes part in reduction – Then –

785
7065
120
130
41
065
847.8

1000 grm

17
7
24 –

Then, of the 210 K 11.1 Li – Li has double Value so it makes 22.2 Li 210 K in the outside Sol – or 232 – ~~[illegible]~~ 142 wanted

232
142
90

leaves 90 grms outside – or 9% Solution of which – 90 grms – 0

213/150/6

1000 grms 210 K 11.1 Li
222 unit –

Required – 142.0 units 10 of which – LiOH –
142
127.8 KOH, 14.2 LiOH –

Thus at 1/2 V 7.1 – LiOH – gram per litre –

1

283
2 – 15
4 30
6 45
8 60 grms – 12

283 grms K
60 LiOH –
343 – actual grms

283
120
403 Reduction Value – 295 Red in 1000
142 Required
153

403) 1350 (3.35
1209
1410
1206
2010

3.35) 1000.0 (295.1
670
3300
3015
1875
1675
175

153 in Sol –
15.3% –

153
15

283
15
298) 1500 (5
1490

1 sq inch 16.5 grms

64 $\frac{1.5}{4}$ in inch

$\frac{1}{4}$ wt 250 wt

27 | 446 (16.5

60 | 446 (7.4

34 - 33

21 - 6 [illegible]

120 | 1100 (916

9 | 446 (49.5

4 | 916

229

687

7.4 | 1250 (17

120 | 840 (700

4 | 700

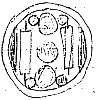
175

525

1 gm

1335

1335



21.00

1 60

120 | 15000 (12.5

2.922

160
5200
32000
800
8320

832000
150
41600000
832000
1248000
1200000
480000
480000

2000000 (62.4

62 HP

150 5240 (1 hr
3

2000000 | 786000

150

15 lbs

3.

150

10 ton 150 lbs

45

52400 161
450 160

28 [illegible] rate. 5200

[illegible] 9 hours

50

45 | 300 (6

60

80 | 800 (6 hours

746) 118000 (.158
746
4340
3730
6100
5968

3 / 158
52

13 / 62.4 HP 16 hours 10 miles hour 150 lbs [illegible]
21

50 watts ton mile 10 tons 500 watts

83 160 miles

746) 80000 (107
500
74600
5400
5222

8000 watt 35

746) 4800 (6 83
160
300
4476

160
500
80000

10 Ton 750 watts per mile —
16 Hours 8 miles hour —
128 miles daily —
A 6 - 240 Cells - 64800 watts.
4 charges of 1 hour each at
200 amp hour -

128
750
6400
896.00

45 - 60 —
50

225
240
900
450
540
1050
648.0

240
3
12)72

60 —

240 Cells A.6 - 280 watts · 67200 watts, out 3 in 1 ⑯ 12 hours out 4 1h chg + all night - Charge at 50 amp in the hour 200 amp in 85% effcny: 212 watts in the 4 chgs in Each cell - 50880 watts total. 118080 which in 12 hours gives 9840 watts per hour - of speed 10 Miles hour + 85 watts mile per ton 10 Tons: 850 watts per ton miles - gives 8500 watts per hour 9840 available - + 8 hours at night for full ~~charging~~ —

850
340
170
212.5

240
848
424
5088

67200
50880
12)118080
108
100
96
1968

16 = 16 50 hours

12)80
72
8

67
12
134
67
804

50 mlg	379	36	41 amp
100 mlg	343	95 +	52
200	438	73 +	61
400	511	43	66.4
700	554	23	81.4
1000	677	106	94
2000	783	314	131.7
3000	1098		

4)1098
274

4)1341
335

120)16100

1341

120)12900

1070

4)1070

1335

1335
27

[illegible]

1098
131.7

280
120
40

3)379 113 6

3)783 23 5 9

3)511 15 3 4

3)343 103 0

3)554 16 6 2

3)438 13 1 3

3)677 20 3 0

3)1098 3 2 9 3

299
330

225
3
675
2000
1350000

224

370

8.7

400
345
69.6
2000

375 | 1392
1175
2675
2625

(370

375 | 135000 (359
1125
2250

90

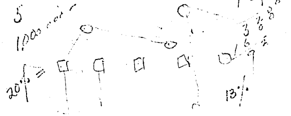
360
17
2520
360
800

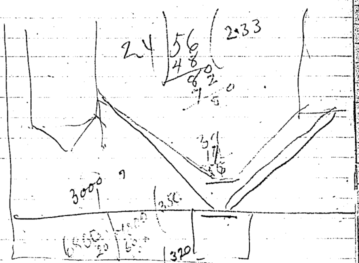
20

100
200,000 - (1600000
1200000

1600
300

5
1000




24 | 56 (2.33
48
80
72

31
17

3000

(2.50

6000
20

1800
60

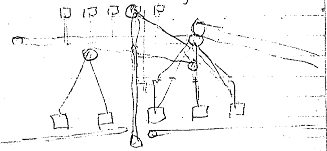
(320

500

6

375 | 120000
1125
750
375

320
17
224
320
544



3)950
300
1200

$\frac{1}{12}$th		
	900	156
	950	164
	1000 –	173
	1050	182
	1100	190
	1150	198
	1200	206
	1250	214
	1300	222
	1350	230
	1400	238

1300
120
1300
156

3)950
317
12)[illegible] (126

1520
126
164

3)1100
367
12)1467 (122

3)1000
333
12)1333 (111

3)1050
350
12)1400 (116

1333
111
1444
1444

1467
122
1589
1906

1400
116
1516
1819

8.7%

175 lbs ton per hour

1000
87

800 – 2000
1,600,000

172
174

375)[illegible] (506

375
1875

175

3)1000
333
1333
2666
1333
1597

3)1050
350
1400
1750

3)1100
367
1467

3)1150
383
3066
1537

3)1250
417
7667
3333
1667
2000

1000	160
1050	168
1100	176
1150	184
1200	192
1250	200
1300	208
1350	216

374
45
1496
163-

60

25.2
6.0

2

25.2
1 30

32.7
453
163

130
93

92-

200

130 for Radiation

60
30

1.7 lbs 150 deg $\frac{1}{10}$ HP hour
got 5 times H.P. loss $\frac{3}{10}$ HP
is 30 deg $\frac{1}{10}$ HP
90

Boil-

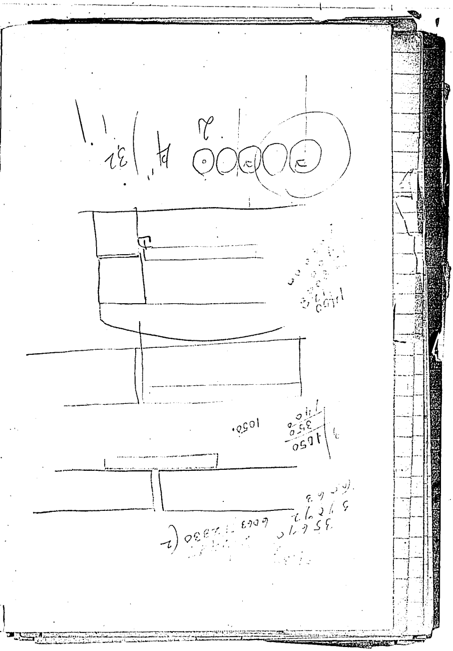
17 lbs Water 150 deg HP Hr.
.3 HP heat in 1 hour -
5 minutes

4 | 13
3

8 lbs.

17 lbs H2O 62 to 212
62
150

1 HP Hour


35670
6063
22830 (2
1050
350
740
1050.
4'
32
2